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U. S. DEPARTMENT OF AGRICULTURE

# THE SPOTTED

# *alfalfa aphid*

## HOW TO CONTROL IT

LEAFLET NO. 422

U. S. DEPARTMENT OF AGRICULTURE

**The spotted alfalfa aphid is a pest of alfalfa grown in 33 States across the southern two-thirds of the United States. Damage in 1954, 1955, and 1956 totaled about $81 million.**

**The insect is especially destructive in alfalfa grown west of the Mississippi.**

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# THE SPOTTED *alfalfa aphid* HOW TO CONTROL IT

The spotted alfalfa aphid [1] is one of several kinds of aphids that attack alfalfa, clover, and other forage legumes. It damages alfalfa by sucking juice from the leaves and stems.

You can control this insect by applying an insecticide.

## APPEARANCE

The spotted alfalfa aphid is pale yellow, and has six or more rows of black spots along its back. It is about one-sixteenth inch long.

The spotted alfalfa aphids commonly seen on alfalfa are female adults and their wingless young, or nymphs. Males are rarely seen.

Most of the female adults are wingless. Those that are winged have smoky areas along the veins of the wings.

A winged adult, a wingless adult, and a nymph are illustrated in natural color on page 5.

## DEVELOPMENT

Females can reproduce without mating. They give birth to living young. Each female produces 25 to 100 nymphs. In warm weather she produces a nymph about every 6 hours. Nymphs mature in 1 or 2 weeks when temperatures are high and in 3 or 4 weeks when the weather is cool. There may be 20 or more generations a year.

The aphid can survive temperatures below freezing, but so far it has not overwintered in the northern part of its range in the United States. Activity is slowed by cold weather. During warm winter days, it can reproduce.

## DAMAGE

Both the adults and the nymphs suck juice from alfalfa leaves and stems. The first sign of their feeding, seen in young alfalfa, is a whitening of the veins of the leaves. Continued feeding causes the leaves to curl, turn yellow, die, and drop. In addition to feeding, the aphids apparently inject a poison into the plants. Seedlings are killed and older plants are retarded or stunted.

Severely infested plants are defoliated; only a few leaves remain near terminals of the branches.

[1] *Therioaphis maculata.*

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Whitened veins of leaves are a sign of early feeding by the spotted alfalfa aphid. (Courtesy of Capper's Farmer.)

The loss of leaves reduces hay and seed yields.

Regrowth following cutting is prevented or retarded. Aphid infestation thins a stand of alfalfa and shortens its life. If severe, infestation may ruin the stand. Thin stands are invaded by weeds. Plants are weakened and cannot withstand injurious soil fungi that invade the roots.

Spotted alfalfa aphids usually feed on undersurfaces of the leaves on the lower parts of the plant. In heavy infestations, they also feed on upper surfaces of leaves, in buds, and on stems. In warm weather aphids are active and move readily from one plant to another. In cool weather they drop to the ground when infested alfalfa plants are disturbed. Winged adults migrate from field to field.

Spotted alfalfa aphids secrete sticky honeydew that interferes with cutting, drying, and baling infested alfalfa. A black mold thrives on the honeydew and discolors the plant. Honeydew and mold lower the quality of hay.

## PLANTS AFFECTED

The spotted alfalfa aphid causes extensive damage only to alfalfa. However, it feeds readily on burclover, medic, and sour and berseem clovers. It also feeds on crimson clover, button clover, strawberry clover, yellow-blossom sweetclover, and alsike clover. It can exist on several other legumes. It does not care for red clover, Ladino clover, white Dutch clover, rose clover, subterranean clover, lespedeza, common vetch, purple vetch, birdsfoot trefoil, sesbania, or other sweetclovers.

*A,* Plant ruined by aphid feeding and blackened by moldy honeydew. *a,* Infested regrowth. *B,* Aphids, greatly magnified. *b,* Winged adult. *c,* Nymph. *d,* Wingless adult. *e,* Droplets of honeydew

## DETECTION

Start looking for aphid infestation as soon as alfalfa seedlings are out of the ground. Examine plants in various parts of the field. If you find 2 or 3 aphids per 10 seedlings, apply an insecticide. If you find any aphids in the field, or if you know that they are in neighboring fields, it will pay you to examine your alfalfa every few days.

On older alfalfa, grown for hay or seed, watch for aphids and honeydew on the plants. Look on the undersurfaces of leaves, especially on lower parts of the plants. Go through your field and examine about 20 plants. If there is an average of 20 to 40 aphids per stem and honeydew is noticeable, apply an insecticide.

## USING INSECTICIDES

You may spray or dust with ground equipment or with an airplane.

Be sure that all alfalfa in the field is treated; any left untreated will harbor aphids that will infest treated alfalfa. Insecticides are most effective if applied when the temperature is above 60° F.

*Hay alfalfa.*—You may spray alfalfa being grown for hay with demeton, parathion, or malathion, or dust with malathion. Demeton is the least harmful to parasites, predators, and other beneficial insects.

*Seed alfalfa.*—On alfalfa being grown for seed, spraying with demeton is less hazardous to pollinating insects than spraying with malathion or parathion.

### Spraying

Apply ground sprays at the rate of 12 or more gallons per acre. With an airplane, as little as 2 gallons per acre is sufficient. If the equipment has been used for applying a herbicide, clean it carefully before applying an insecticide.

*Demeton.*—To treat 1 acre of alfalfa, mix 1 pint of 25-percent demeton emulsifiable concentrate (0.25 pound of demeton) with the required amount of water.

*Malathion.*—To treat 1 acre of alfalfa, mix 1 pint of 57-percent malathion emulsifiable concentrate (0.6 pound of malathion) with the required amount of water.

*Parathion.*—To treat 1 acre of alfalfa, mix 1 pint of 25-percent parathion emulsifiable concentrate (0.25 pound of parathion) with the required amount of water.

### Dusting

Apply to each acre of alfalfa 15 pounds of 5-percent malathion dust (0.75 pound of malathion) or 20 pounds of 4-percent dust (0.8 pound of malathion).

### Protection of Pollinators

You may safely apply demeton whenever bees are not active in the field. Parathion and malathion are very toxic to bees. Do not apply these materials to alfalfa in bloom unless it is absolutely necessary and then only in the evening after the bees have left the field.

### *Precautions*

Do not feed alfalfa treated with demeton until 21 days after application, until 15 days following treatment with parathion, or until 7 days after treatment with malathion.

Insecticides are poisonous. Handle them with care. Follow directions and heed all precautions on the container label.

Many new insecticides can be absorbed directly through the skin in hazardous quantities. When handling or mixing an insecticide, avoid spilling it on your skin or clothing. Try to keep it out of your eyes, nose, and mouth. If you spill it on skin or clothing, wash it off and change your clothing immediately. Wear a respirator and goggles when you work with concentrated sprays or dusts.

Parathion and demeton are extremely poisonous. Be certain that the person who applies them is thoroughly familiar with their hazards, and will assume full responsibility for using them safely and complying with all precautions on the label. Check with your county agricultural agent, extension entomologist, or State agricultural experiment station for regulations affecting the use of these materials in your State.

Store insecticides in closed containers in a dry place where children, irresponsible persons, and animals cannot reach them. Be sure that insecticides are clearly labeled.

If you accidentally swallow an insecticide, induce vomiting by taking 1 tablespoonful of salt in a glass of warm water. Repeat if necessary. Call a doctor.

## PREDATORS

Several insects kill and feed on the spotted alfalfa aphid. Usually, they do not destroy enough aphids to control a serious infestation and prevent crop damage, but they may hold down light infestations and delay reinfestation after an insecticide application.

Adults and larvae of lady beetles (a dozen or more kinds) are important natural enemies of aphids, especially in the spring and fall and in stubble fields following the cutting of alfalfa. Larvae of syrphid flies and lacewing flies sometimes devour large numbers of spotted alfalfa aphids. Damsel bugs, bigeyed bugs, pirate bugs, and predaceous beetles and spiders destroy many aphids.

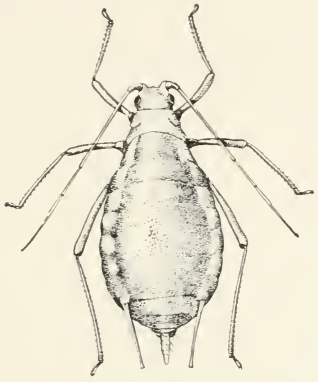
## PARASITES AND DISEASES

Native insect parasites of aphids have not attacked the spotted

### The Pea Aphid

The pea aphid (*Macrosiphum pisi*), which attacks alfalfa, may be mistaken for the spotted alfalfa aphid.

This aphid is twice as large as the spotted alfalfa aphid. It is light green, and is not spotted. Winged forms do not have smoky areas along the veins of the wings.



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The pea aphid: Wingless female.

The pea aphid usually begins feeding on plant tips and on upper leaves as they open, then feeds on lower foliage. It secretes less honeydew than the spotted alfalfa aphid.

C&F 5978

Lahontan alfalfa, resistant to the spotted alfalfa aphid, grows in plot in background. Other varieties are susceptible and show aphid damage.

alfalfa aphid. Three kinds of small wasps that parasitize aphids in Europe and Asia were imported, reared in large numbers, and released in infested States. They have become established in several States. In certain areas of California, very encouraging results toward control of this aphid with two of these parasite species have been reported.

Fungus diseases, presumably native, attack the spotted alfalfa aphid in some areas, especially during wet spells or following irrigation. Under these conditions and in the more humid areas of the country they may kill large numbers of aphids and aid in control.

## RESISTANT VARIETIES

Growing alfalfa varieties that are resistant to the spotted alfalfa aphid eventually should reduce damage caused by this insect.

One variety, Lahontan, developed cooperatively by the United States Department of Agriculture and the Nevada Agricultural Experiment Station for resistance to other pests, shows remarkable resistance to the aphid. This variety, released in 1954 by the Nevada and California Agricultural Experiment Stations, can be grown in infested areas where it is adapted. It will also serve as a valuable source of resistance in developing other varieties resistant to the aphid and adapted to different areas.

Another recently developed variety named "Moapa" is a nondormant alfalfa adapted to the arid, irrigated areas of the Southwest.

Researchers are working to produce other resistant varieties adapted to other areas of the country. Ask your county agricultural agent or State agricultural experiment station for the latest information on resistant varieties.

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